## IN THE CLAIMS

1. (Currently Amended) A photo radiation intensity directional sensor ~~(1)~~ comprising a housing ~~(2)~~ having a transparent or translucent portion ~~(4)~~, and a printed circuit board ~~(7)~~ placed in such way in the housing ~~(2)~~ that one of its edges ~~(37)~~ faces the transparent or translucent portion ~~(4)~~, ~~where~~ at least a first and a second sensing element ~~(5a, 5b)~~ sensitive to radiation are placed at a first side ~~(7')~~ of the printed circuit board ~~(7)~~, where the first and second sensing elements ~~(5a, 5b)~~ are separated by a first flange ~~(8)~~, serving as a shading element, ~~characterised in that~~ at least a third sensing element ~~(5'; 5c)~~ sensitive to radiation is placed at a second side ~~(7'')~~ of the printed circuit board ~~(7)~~, where said sensing elements ~~(5a, 5b, 5'; 5c)~~ are arranged to detect both the direction and the intensity of the radiation source and for producing output signals which are used for estimating the sun radiation heating impact, and where the printed circuit board ~~(7)~~ is arranged in such a way that it functions as a shading element between the areas on its first ~~(7')~~ and second ~~(7'')~~ side where the sensing elements ~~(5a, 5b, 5'; 5c)~~ are mounted.

2. (Currently Amended) A photo radiation intensity directional sensor according to claim 1, ~~characterized in that~~ wherein a fourth sensing element ~~(5d)~~ is placed at the second side ~~(7'')~~ of the printed circuit board ~~(7)~~, where the third ~~(5c)~~ and fourth ~~(5d)~~ sensing elements are separated by a second flange ~~(9),~~ serving as a shading element.

3. (Currently Amended) A photo radiation intensity directional sensor according to ~~any one of the claims 1 or~~ claim 2, ~~characterized in that~~ wherein the housing ~~(2)~~ comprises a chamber ~~(36)~~ containing a diffusive compound ~~(35)~~ that is a potting, which compound ~~(35)~~ is positioned between said housing ~~(2)~~ and ~~said~~ at least one of the first, second, third or fourth sensing elements ~~element (5a, 5b, 5'; 5c, 5d)~~.

4. (Currently Amended) A photo radiation intensity directional sensor according to claim

1 ~~any one of the preceding claims, c h a r a c t e r i z e d i n that~~ the shading elements ~~(7, 8, 9)~~ are arranged to prevent exposure of radiation to the sensing elements, ~~(5a, 5b, 5'; 5c, 5d)~~ which are separated by the shading elements ~~(7, 8, 9)~~, to a degree depending on the position of the photo radiation intensity directional sensor ~~(1)~~ in relation to a source of photo radiation, said shading elements ~~(7, 8, 9)~~ are thereby arranged for creating differences in output amplitudes from the sensing elements ~~(5a, 5b, 5'; 5c, 5d)~~, which difference in amplitude is used for estimating the position of the source of radiation.

5. (Currently Amended) A photo radiation intensity directional sensor according to claim 1, wherein ~~any one of the claims 3 or 4, c h a r a c t e r i z e d i n that~~ the shading elements ~~(7, 8, 9)~~ divide said chamber ~~(36)~~ into sub compartments, each containing one or several sensing elements ~~(5a, 5b, 5'; 5c, 5d)~~.

6. (Currently Amended) A photo radiation intensity directional sensor according to claim 5, ~~c h a r a c t e r i z e d i n that~~ the chamber ~~(36)~~ includes a top region ~~(39)~~ forming part of said sub compartments ~~(12, 13; 25, 26)~~, where said top region ~~(39)~~ is vertically arranged in relation to said shading elements ~~(7, 8, 9)~~ such that said shading elements ~~(7, 8, 9)~~ do not prevent photo radiation from impinging on at least a portion of each sub compartment ~~(12, 13; 25, 26)~~ in said top region ~~(39)~~.

7. (Currently Amended) A photo radiation intensity directional sensor according to claim 6, ~~c h a r a c t e r i z e d i n that~~ said top region ~~(39)~~ is positioned vertically above said shading elements ~~(7, 8, 9)~~.

8. (Currently Amended) A photo radiation intensity directional sensor according to ~~any one of the claims 5 or 6, c h a r a c t e r i z e d i n that~~ claim 5, wherein said chamber ~~(36)~~ includes a bottom region ~~(46)~~ forming part of said at least three sub compartments ~~(12, 13; 25, 26)~~, where said bottom region ~~(46)~~ is vertically arranged below an upper edge ~~(37, 38)~~ of each of said shading elements ~~(7, 8, 9)~~.

9. (Currently Amended) A photo radiation intensity directional sensor according to ~~any one of the preceding claims, c h a r a c t e r i z e d i n that~~ claim 3, wherein said sensing elements ~~(5a, 5b, 5'; 5c, 5d)~~ are positioned inside said chamber ~~(36)~~ and being exposed to said diffusive compound ~~(35)~~.

10. (Currently Amended) A photo radiation intensity directional sensor according to ~~any one of the preceding claims, c h a r a c t e r i z e d i n that~~ claim 9, wherein said compound ~~(35)~~ is arranged to preserve said sensing elements ~~(5a, 5b, 5'; 5c, 5d)~~ from oxidizing.

11. (Currently Amended) A photo radiation intensity directional sensor according to ~~any one of the claims 2-10, c h a r a c t e r i z e d i n that~~ claim 3, wherein the printed circuit board ~~(7)~~ carries further electronic circuits, and is positioned at least partly inside said chamber ~~(36)~~ such that said electronic circuits and sensing elements ~~(5a, 5b, 5'; 5c, 5d)~~ are protected from negative influence on the environment by the diffusive compound ~~(35)~~.

12. (Currently Amended) A photo radiation intensity directional sensor ~~according to any of the preceding claims, c h a r a c t e r i z e d i n that~~ claim 1, wherein said photo radiation intensity sensor includes a radiation filter transparent to a defined frequency interval, which radiation filter is arranged to block radiation outside said frequency interval from impinging on said sensing elements.

13. (Currently Amended) A photo radiation intensity directional sensor according to claim 12, ~~c h a r a c t e r i z e d i n that~~ wherein said radiation filter is constituted by said compound ~~(35)~~.

14. (Currently Amended) A photo radiation intensity directional sensor according to claim 12, ~~c h a r a c t e r i z e d i n that~~ said radiation filter includes ~~is constituted by~~ a lens

element ~~(4)~~.

15. (Currently Amended) A photo radiation directional intensity sensor according to ~~any of the preceding claims, characterized in that~~ claim 2, wherein said sensing elements ~~(5a, 5b, 5'; 5c, 5d)~~ are sensitive to infrared and/or visible light.

16. (Currently Amended) A photo radiation directional intensity sensor according to ~~any of the preceding claims, characterized in that~~ claim3, wherein said diffusive compound ~~(35)~~ is a liquid or a gel.

17. (Currently Amended) A photo radiation directional intensity sensor calibration method for a sensor ~~according to claim 1~~ having a housing with a transparent or translucent portion, a printed circuit board positioned in the housing, the printed circuit board having one edge facing the transparent or translucent portion, at least a first sensing element and a second sensing element sensitive to radiation being positioned at a first side of the printed circuit board, the first and second sensing elements being separated by a first flange, serving as a shading element, at least a third sensing element sensitive to radiation is placed at a second side of the printed circuit board, wherein said sensing elements are arranged to detect both the direction and the intensity of the radiation source and for producing output signals which are used for estimating the sun radiation heating impact, and wherein the printed circuit board is arranged in such a way that it functions as a shading element between the areas on its first and second side where the sensing elements are mounted, comprising ~~the steps~~:

rotating the sensor ~~(1)~~ 360° in azimuth and from 0° to 90° in elevation under a fixed light source, which rotation takes place in predetermined steps;

measuring all the azimuth steps for each elevation step, where each measurement results in a value from each sensing element ~~(5a, 5b, 5'; 5c, 5d)~~ that is part of the sensor ~~(1)~~;

saving the acquired data amount in the form of tables and comparing with those of

an ideal solar sensor; and

calculating correction coefficients from this comparison.

18. (Currently Amended) Calibration method according to claim 17, wherein calculating correction coefficients includes forming ~~c h a r a c t e r i z e d i n that~~ tables containing these correction coefficients, which tables are converted into graphs, and storing the tables ~~are stored~~ in a digital memory for every individual solar sensor.

19. (Currently Amended) A photo radiation directional intensity sensor measuring method for a sensor ~~according to claim 1~~ having a housing with a transparent or translucent portion, a printed circuit board positioned in the housing, the printed circuit board having one edge facing the transparent or translucent portion, at least a first sensing element and a second sensing element sensitive to radiation being positioned at a first side of the printed circuit board, the first and second sensing elements being separated by a first flange, serving as a shading element, at least a third sensing element sensitive to radiation is placed at a second side of the printed circuit board, wherein said sensing elements are arranged to detect both the direction and the intensity of the radiation source and for producing output signals which are used for estimating the sun radiation heating impact, and wherein the printed circuit board is arranged in such a way that it functions as a shading element between the areas on its first and second side where the sensing elements are mounted, comprising ~~the steps~~:

measuring the output values ~~U1, U2, U3, U4~~ from each sensing element ~~(5a, 5b, 5'; 5c, 5d)~~, and saving the measurement values to a digital memory;

calculating an average value ~~$U_{avg}$~~ of the signal acquired from the sensing elements ~~(5a, 5b, 5'; 5c, 5d)~~, which average value ~~$U_{avg}$~~ is proportional to the intensity of the detected radiation;

calculating differences between output signals of opposite sensing elements ~~(5a, 5b; 5'; 5c, 5d)~~;

calculating normalized values p and q of the above differences by dividing them

with the average value ~~$U_{avg}$~~;

calculating a first azimuth angle value $A_z = C_1 \arctan(p/q)$, where $C_1$ is a constant;

calculating a corrected azimuth angle value, using the calculated first azimuth value $A_z$ and using comparison with correction coefficients;

calculating a first elevation angle value $E = C_2\sqrt{p^2 + q^2}$ where $C_2$ is a constant;

calculating a corrected elevation angle value, using the calculated first elevation angle value E and using comparison with correction coefficients;

calculating a first intensity value $I = C_3$~~$U_{avg}$~~ * the average value, where $C_3$ is a constant; and

calculating a corrected intensity value, using the calculated first intensity value E and using comparison with correction coefficients.

20. (Currently Amended) Measuring method according to claim 19, wherein ~~characterized in that~~ the correction coefficients are those which are determined ~~according to any one of the claims 17 or 18~~ by: rotating the sensor 360° in azimuth and from 0° to 90° in elevation under a fixed light source, which rotation takes place in predetermined steps; measuring all the azimuth steps for each elevation step, wherein each measurement results in a value from each sensing element that is part of the sensor; saving the acquired data amount in the form of tables and comparing with those of an ideal solar sensor; and calculating correction coefficients from this comparison.

21. (New) The measuring method according to claim 20, wherein calculating correction coefficients includes forming tables containing these correction coefficients, which tables are converted into graphs, and storing the tables in a digital memory for every individual solar sensor.